

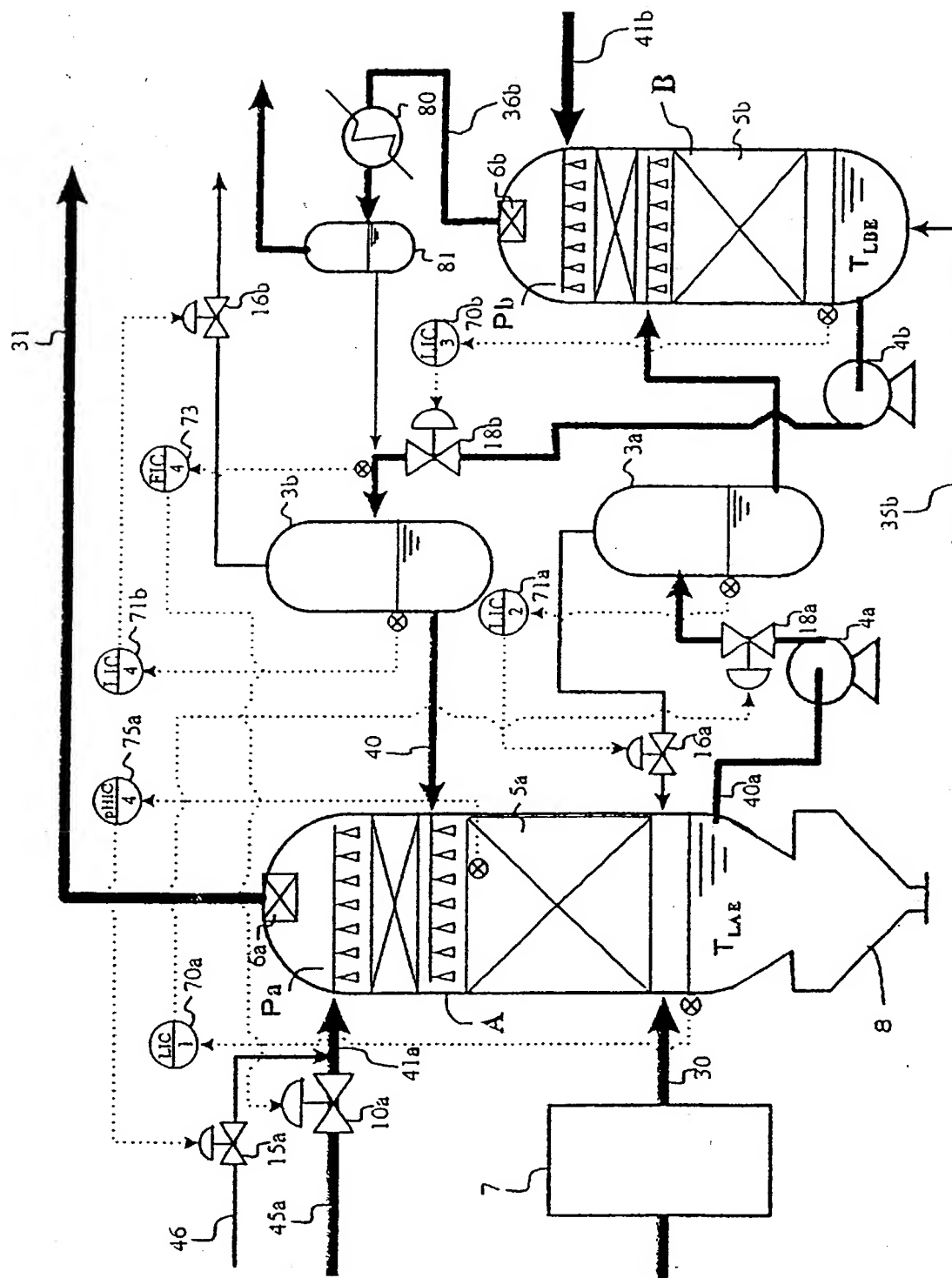
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FIG. 1



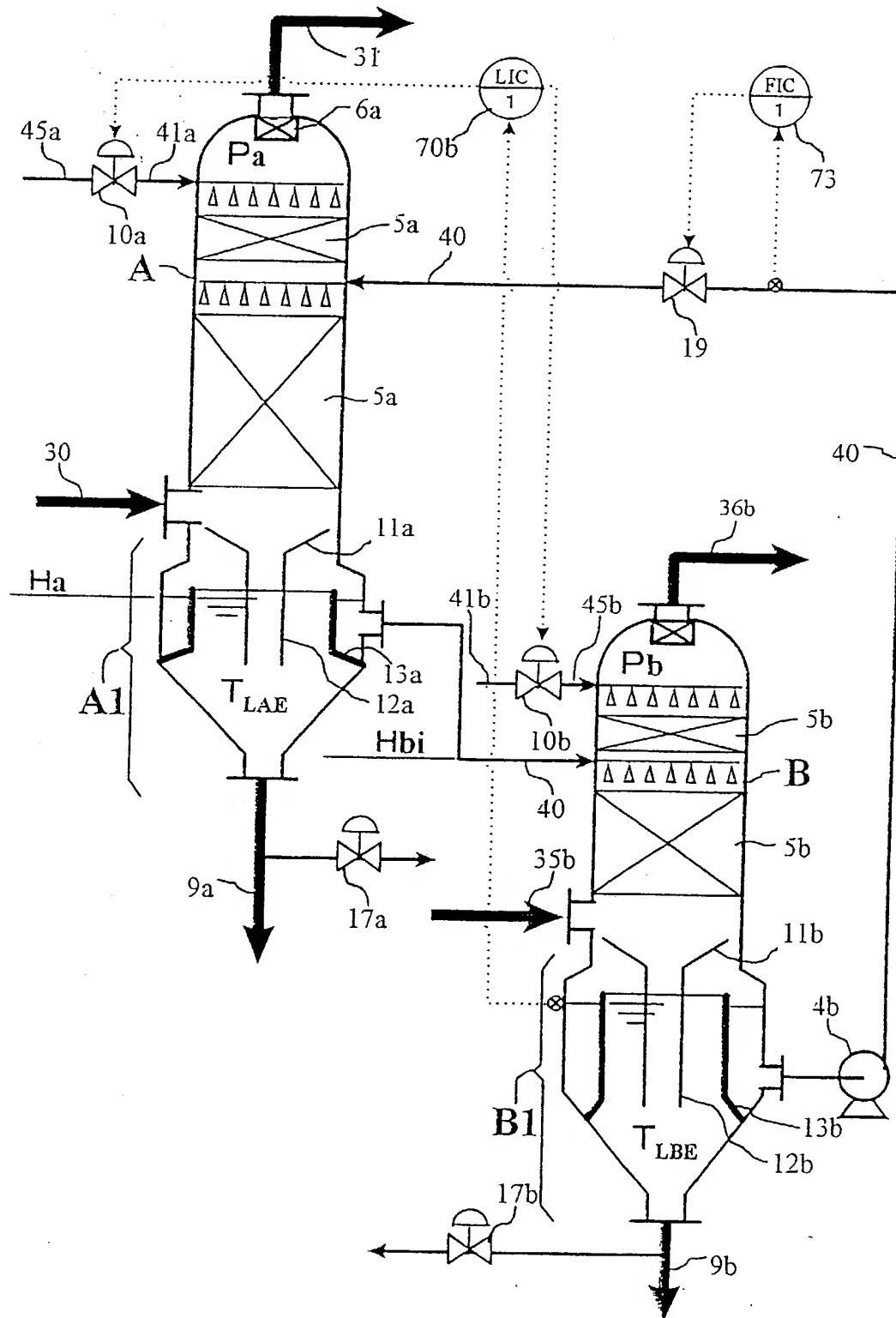
2/20

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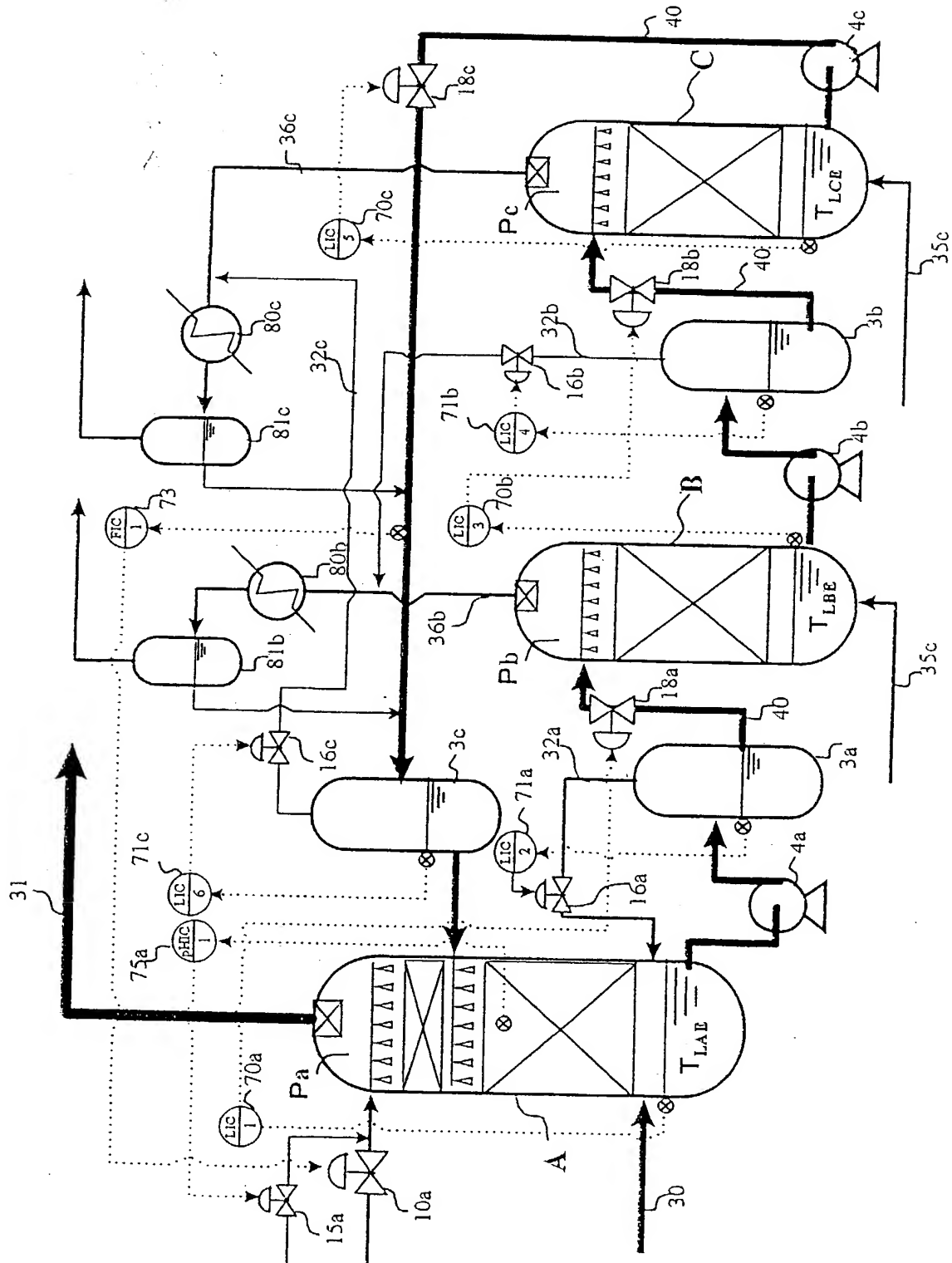
FIG. 2



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FIG. 3



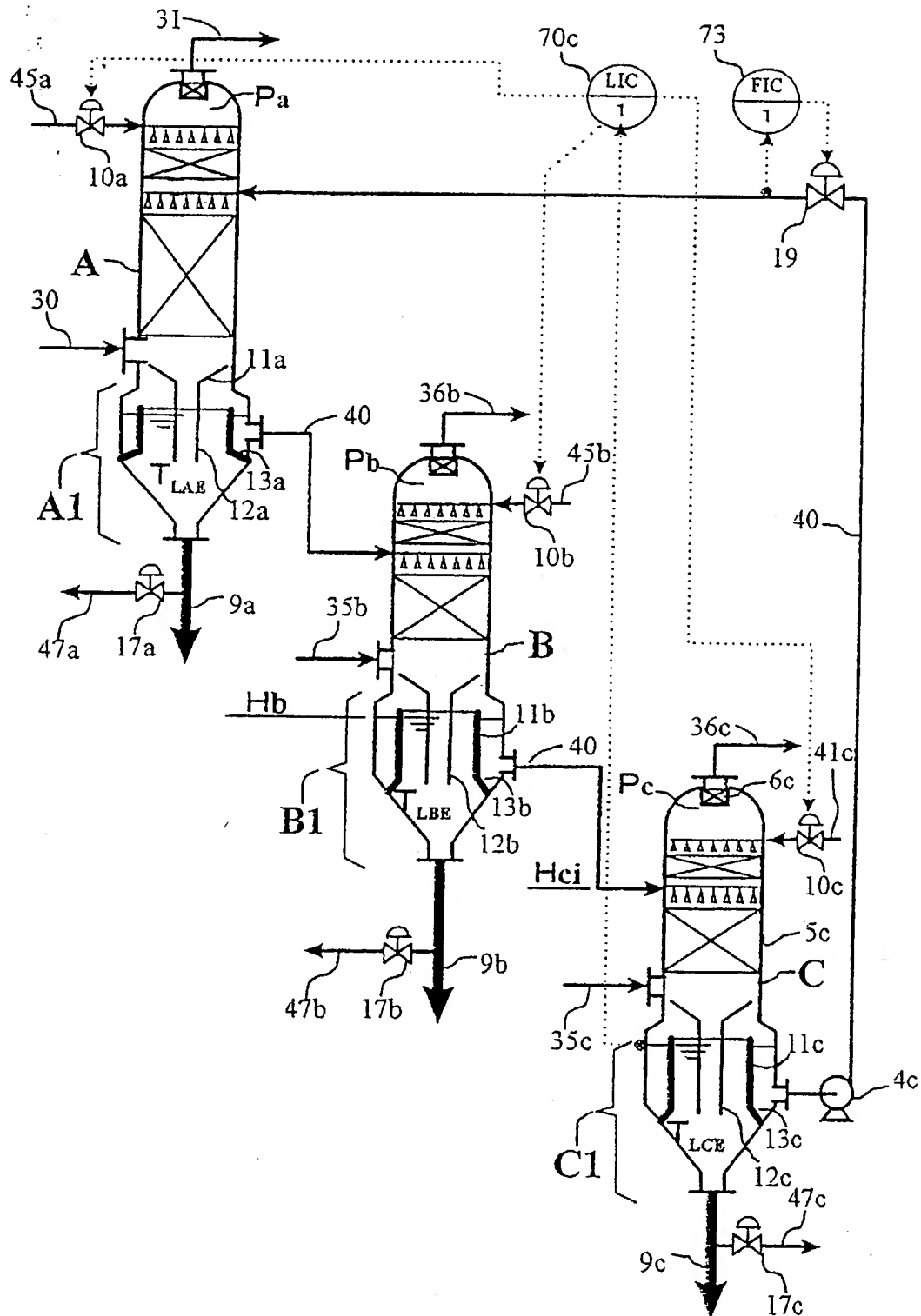
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FIG. 4





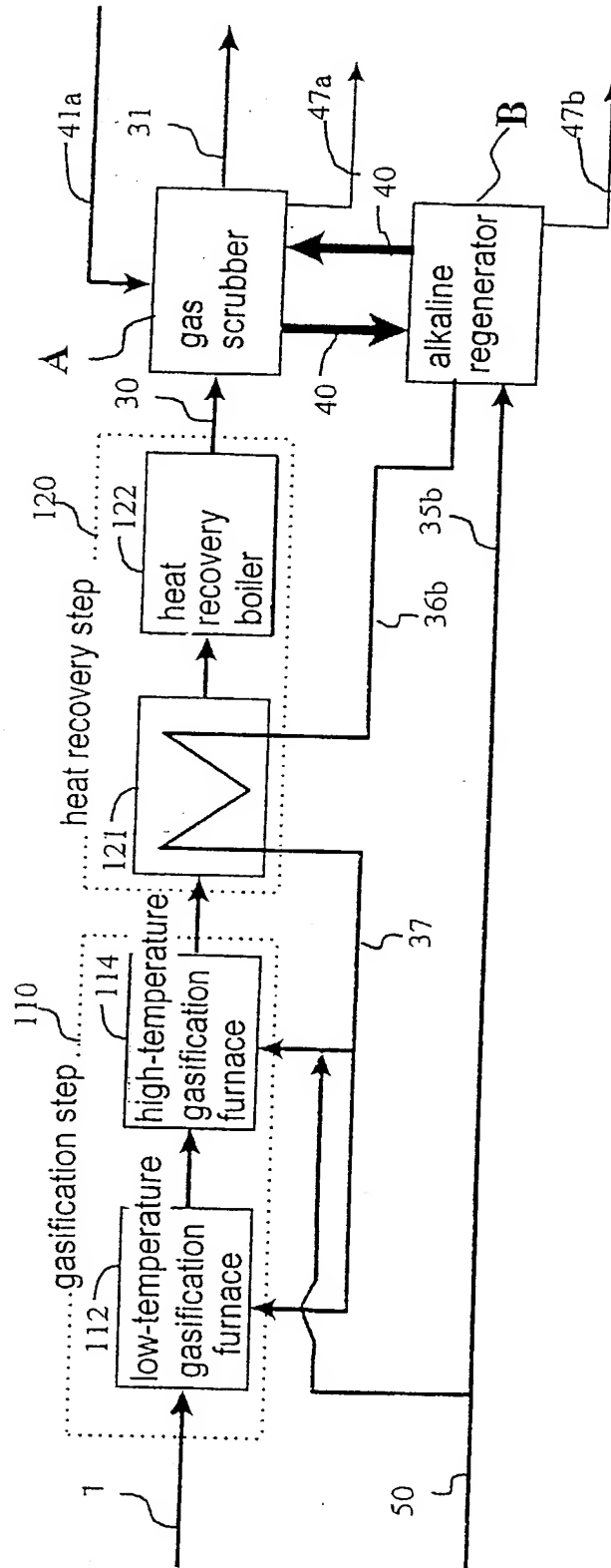
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FIG. 5





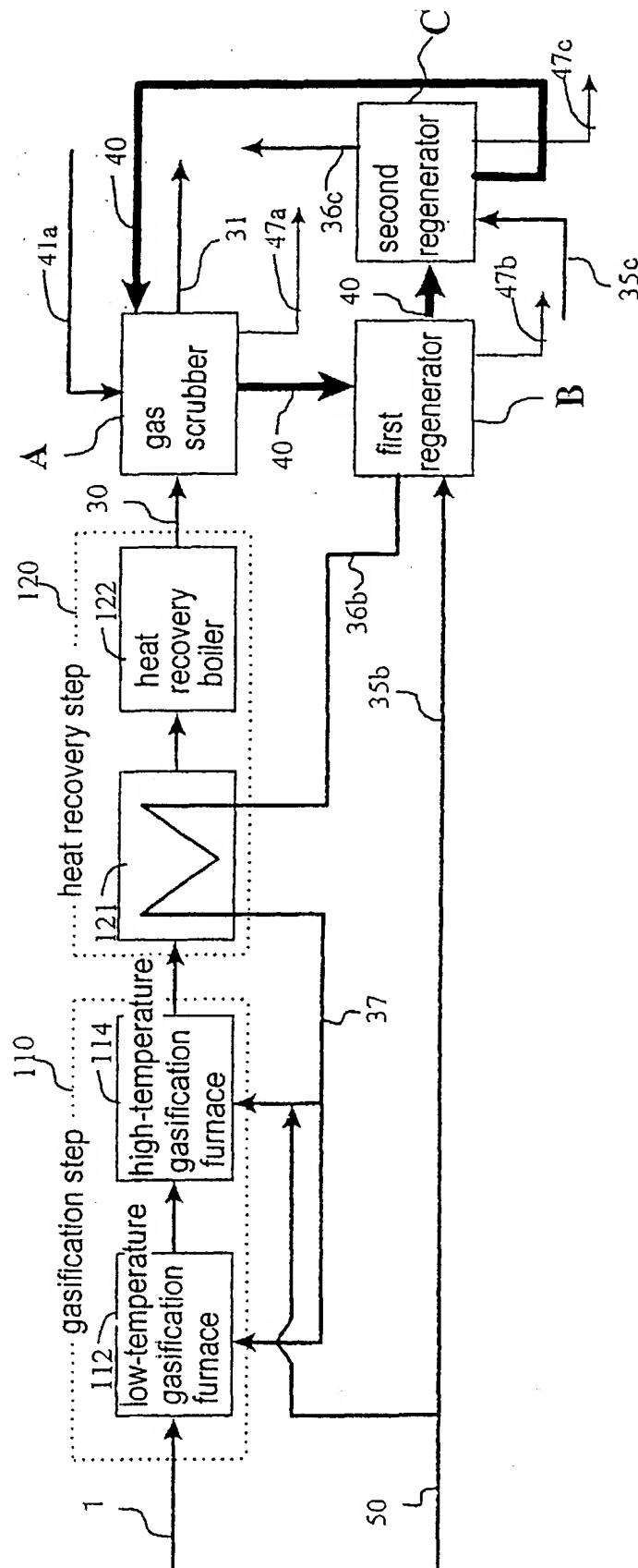
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FIG. 6

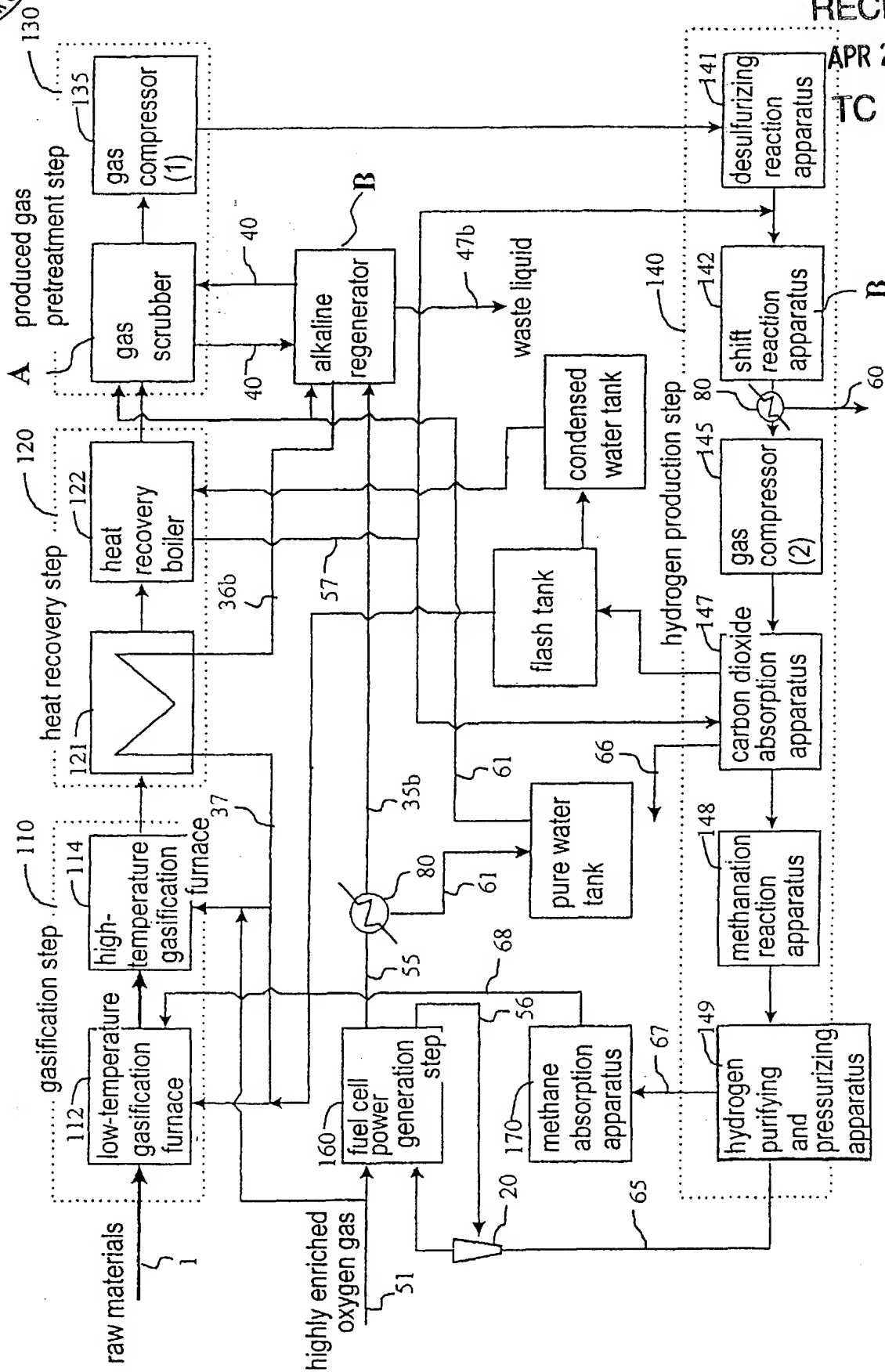


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FIG. 7



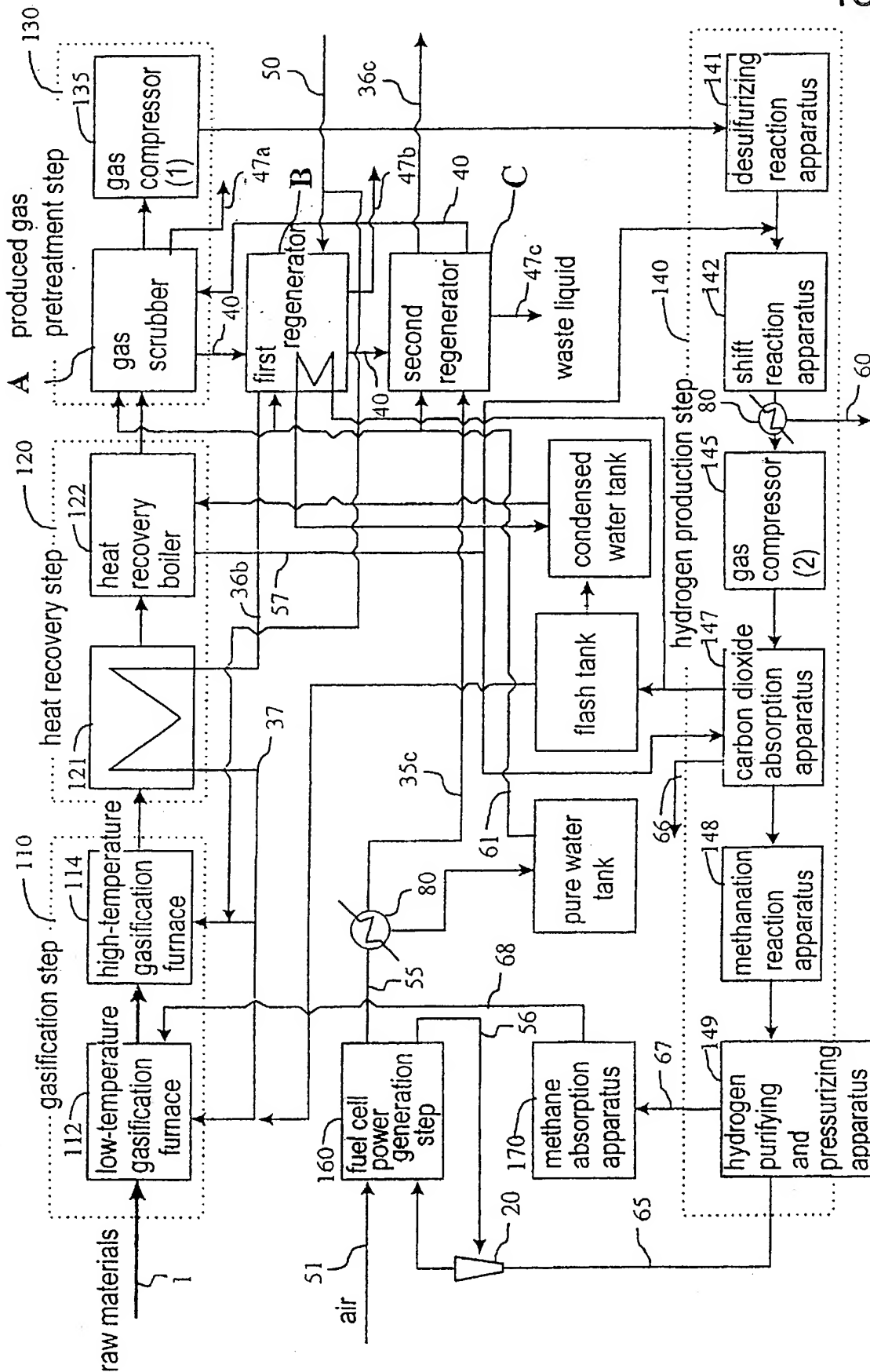
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FIG. 8





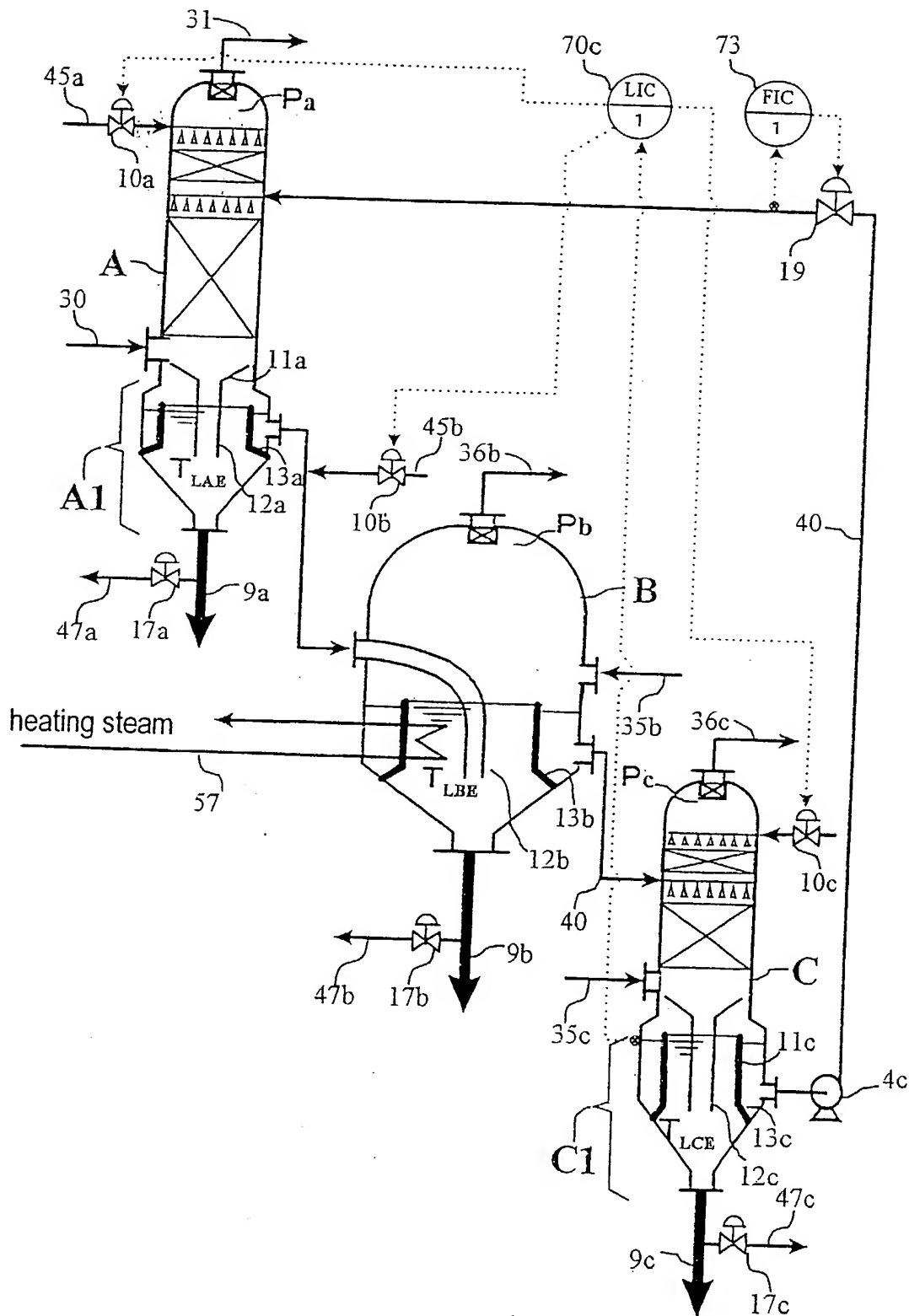
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FIG. 9



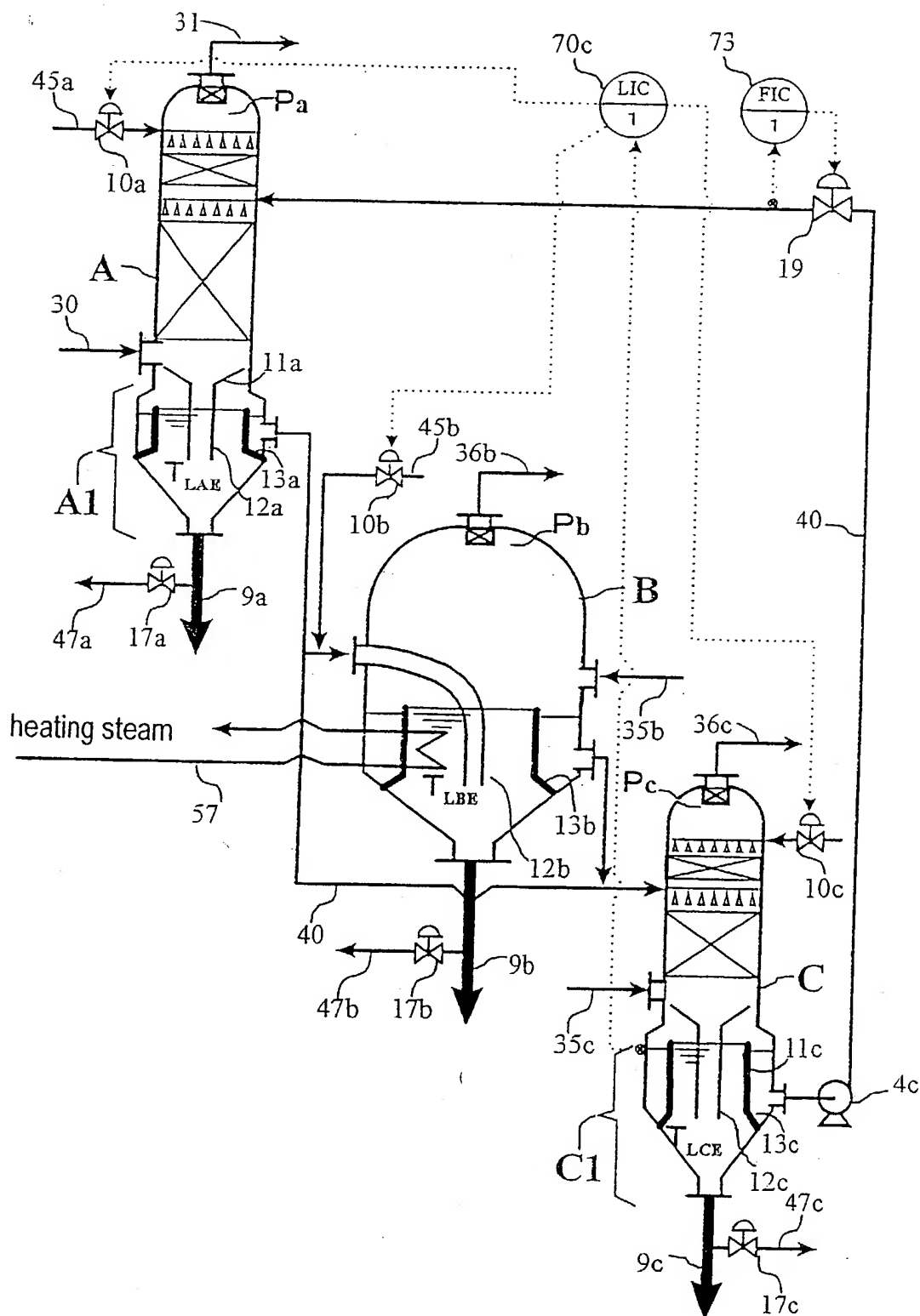
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FIG. 10

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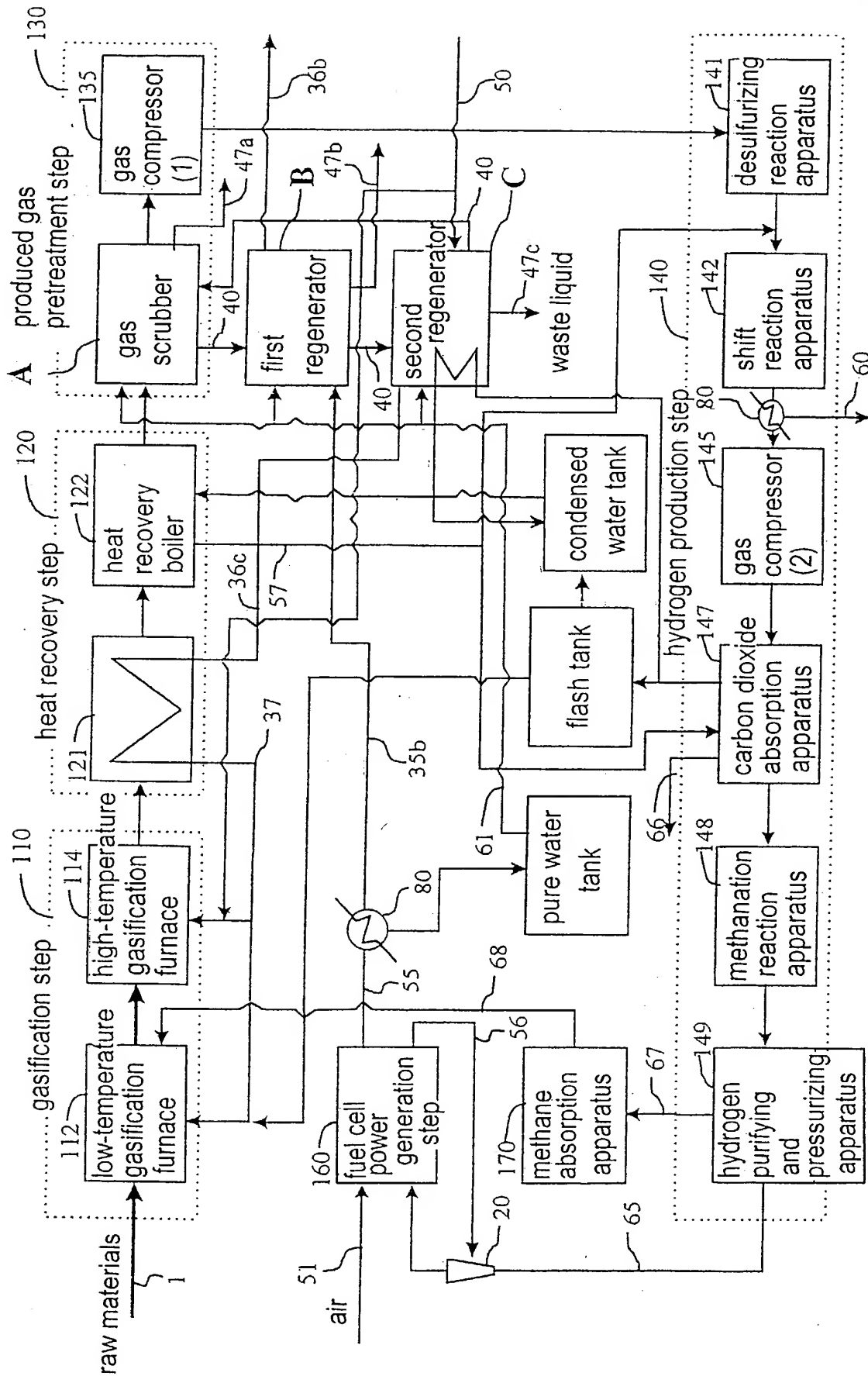
APR 22 2004

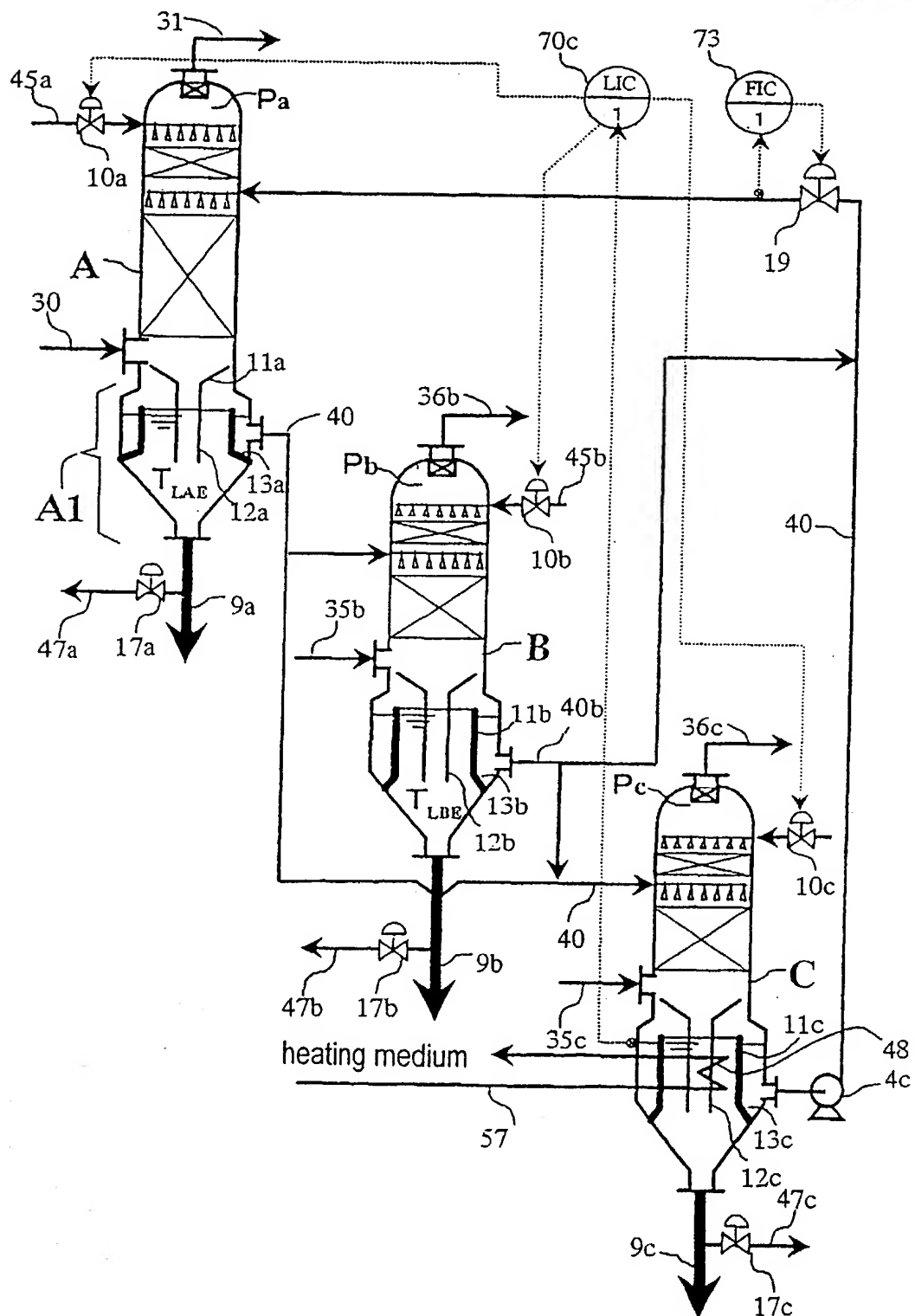
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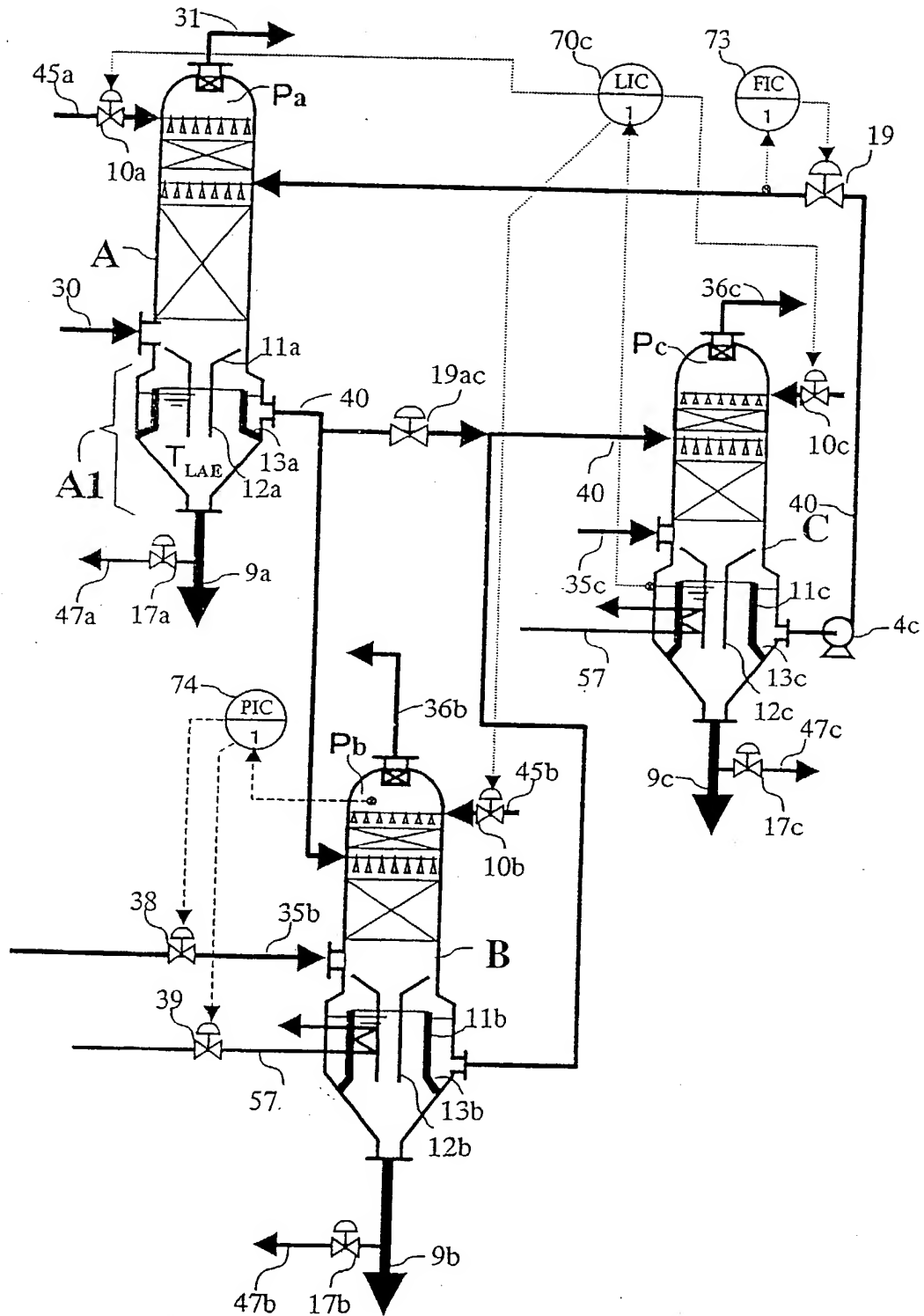
FIG. 11





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FIG. 13



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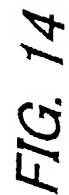


FIG. 14

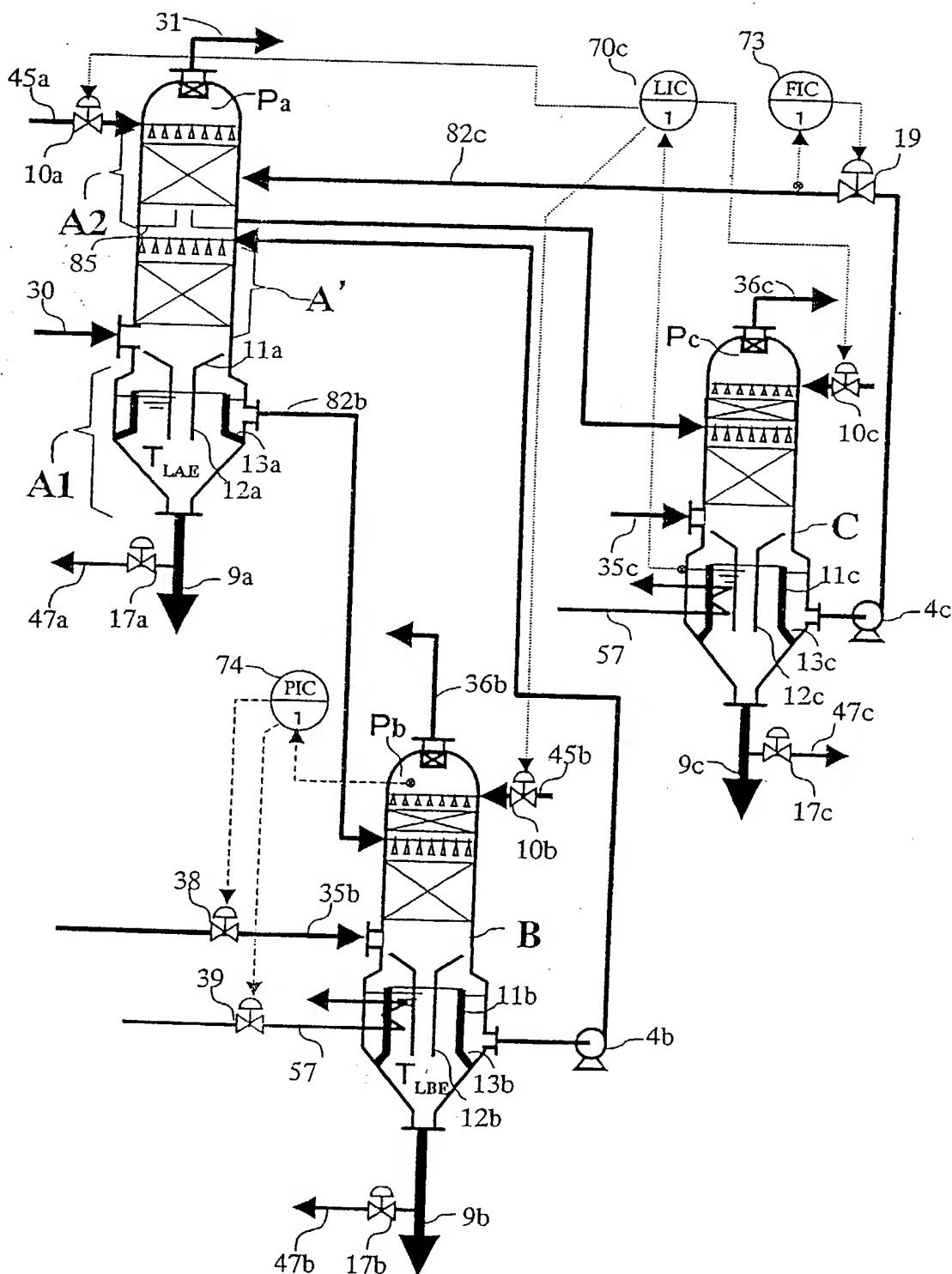
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FIG. 15

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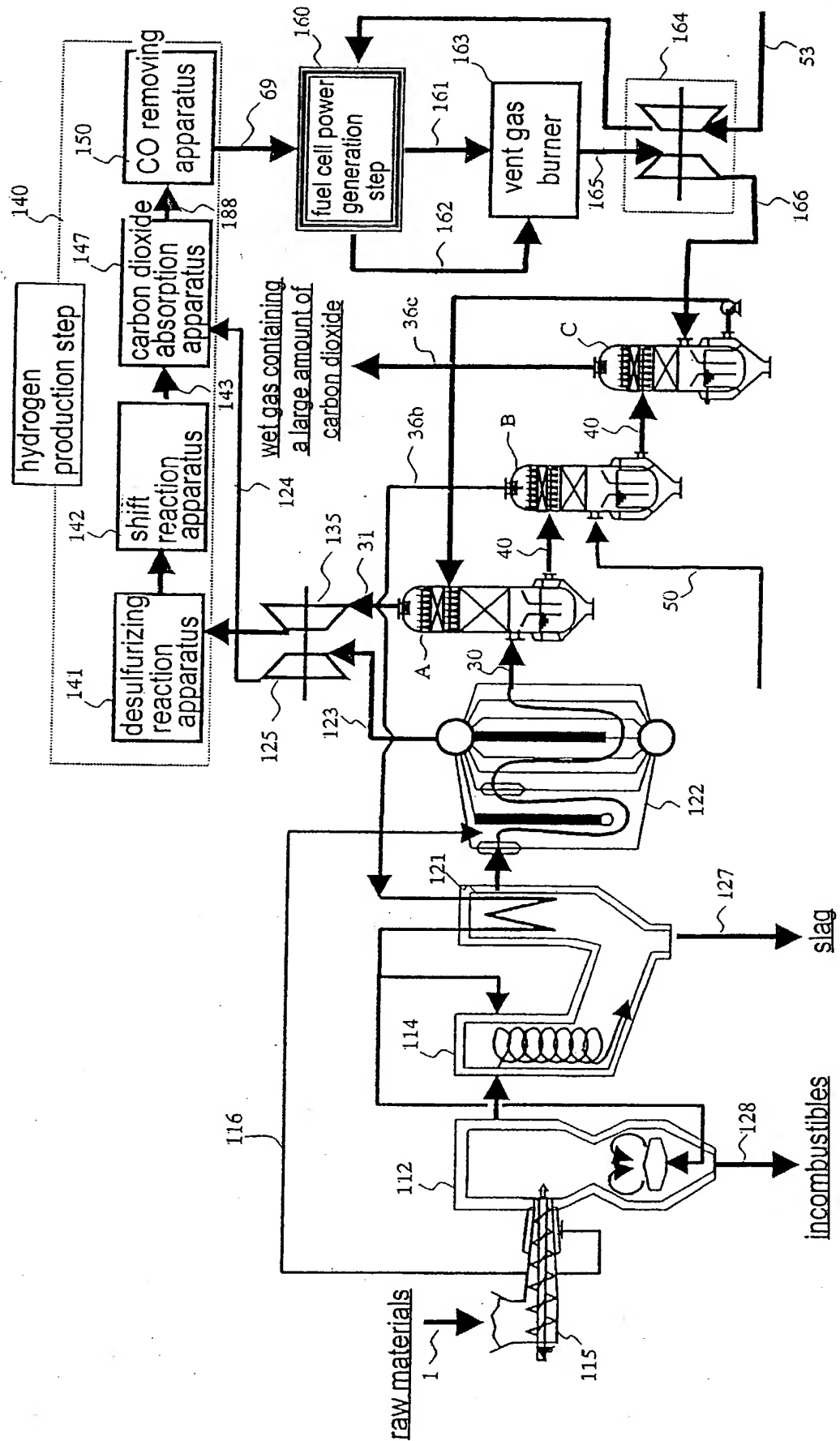
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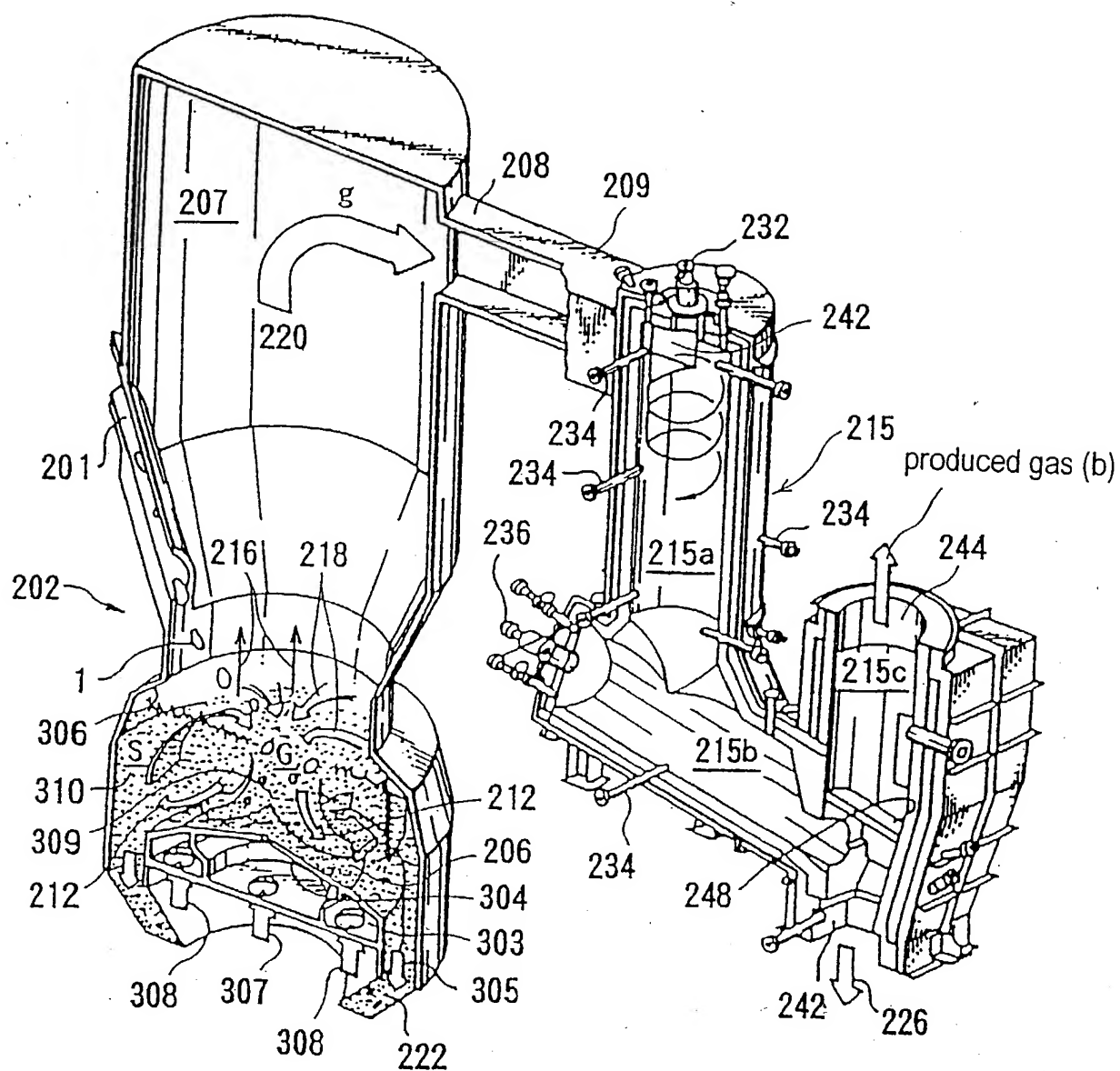


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FIG. 16







"REPLACEMENT SHEET"

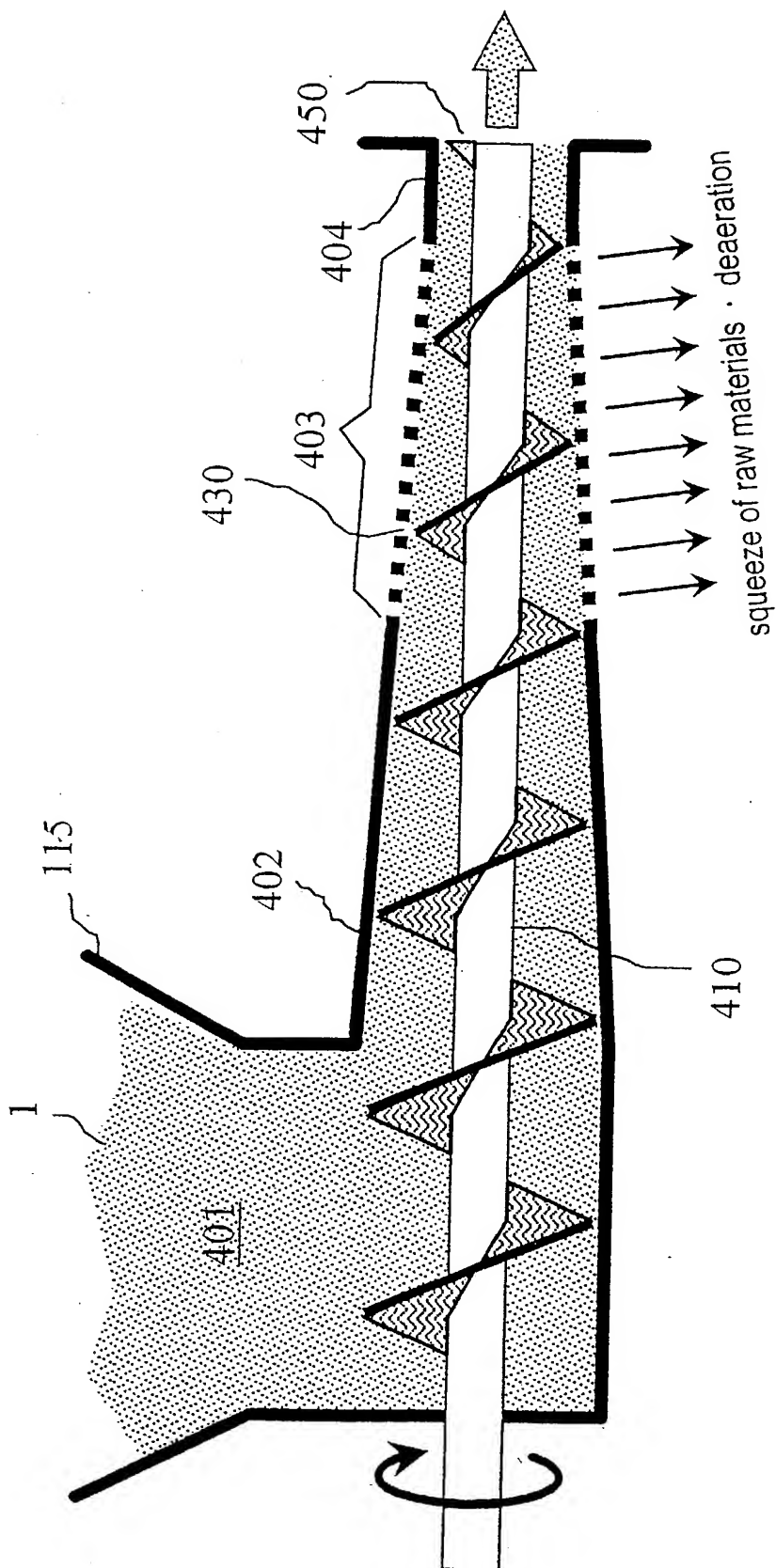
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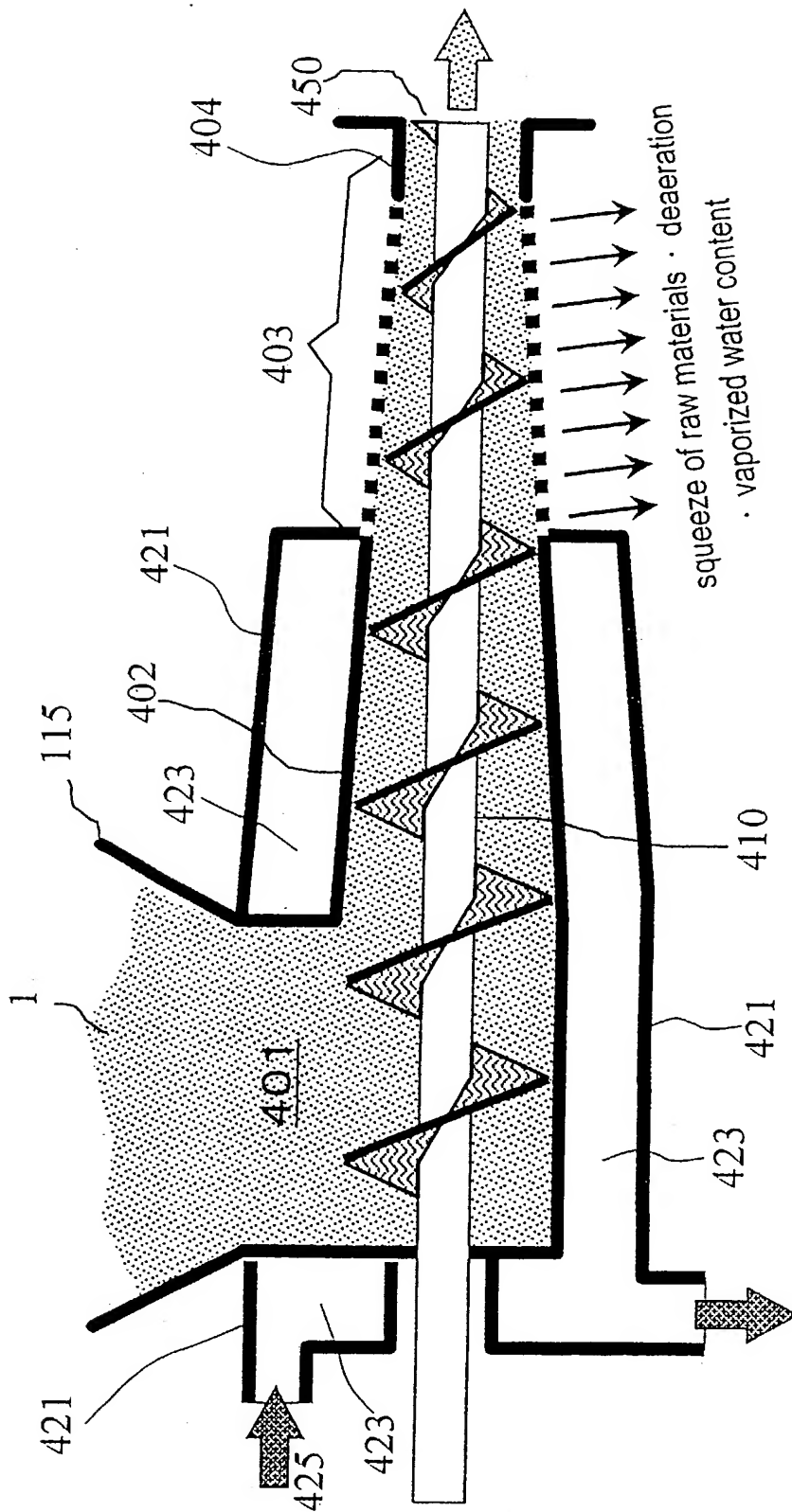
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FIG. 18





The diagram illustrates a hydrogen production system integrated with a blast furnace. The process begins with **raw materials** (1) entering a **blast furnace** (115). The furnace is divided into sections (112, 114, 121) and includes a **slag** outlet (127) and an **incombustibles** outlet (128). The gas stream from the furnace passes through a **desulfurizing reaction apparatus** (141) and a **shift reaction apparatus** (142). The resulting gas then enters a **CO removing apparatus** (150), which is part of a **carbon dioxide absorption apparatus** (147). The purified gas is then fed into a **fuel cell power generation step** (160) and a **vent gas burner** (161). The system also includes a **hydrogen production step** (140) and a **CO removing apparatus** (150). The gas flow is controlled by various valves (123, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200) and pumps (121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200). The system is designed to produce hydrogen gas for use in the blast furnace.